AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

Listing of Claims:

Claim 1 (Currently Amended): A low-noise optical frequency converter, comprising:

means for converting an input light wave with ~~a frequency converter that uses~~ a predetermined microwave electric signal to ~~modulate an input light wave and~~ output a light wave that includes a first-order upper-sideband or lower-sideband and a third-order lower-sideband or upper-sideband,

means ~~the frequency converter including a first constitution~~ for modulating a light wave identical to the input light wave with a signal having an angular frequency that is three times that of the microwave electric signal to form a first light wave having a first-order lower-sideband or upper-sideband, and

means ~~a second constitution~~ for mixing the first light wave with a second light wave having a first-order upper-sideband or lower-sideband and a third-order lower-sideband or upper-sideband, with a phase of the third-order lower-sideband or upper-sideband reversed to a phase of the first light wave~~, the second constitution having a function of suppressing~~ to suppress third-order sidebands.

Claim 2 (Currently Amended): A low-noise optical frequency converter, comprising:

a light wave input section;

a modulation signal input section;

a modulated light wave output section;

a Mach-Zehnder interferometer type single sideband (SSB) ~~SSB~~ modulator configured to modulate ~~for modulating~~ a light wave input to the light wave input section,

provided with a first Mach-Zehnder interferometer type optical modulator and a second Mach-Zehnder interferometer type optical modulator on respective optical paths;

means for inputting a fundamental wave of a predetermined microwave electric signal;

a circuit configured to generate ~~for generating~~ a wave having a frequency that is triple a frequency of the fundamental wave;

means for adjusting an amplitude of the triple-frequency wave;

delay means ~~that can adjust~~ for adjusting a phase difference between the fundamental wave and the triple-frequency wave;

means [[of]] for mixing the fundamental wave and the triple-frequency wave and generating an output; and

means [[of]] for applying the mixing means output to the modulation signal input section;

wherein a noise component arising from the fundamental wave of the microwave electric signal is suppressed by a light wave component produced by modulation of the mixing means output with the triple-frequency wave.

Claim 3 (Currently Amended): The low-noise optical frequency converter according to claim 2, wherein the means for mixing ~~means~~ and the means ~~of~~ for applying the mixing means output to ~~supplying electricity to~~ the modulation signal input section are constituted by a 90-degree hybrid ~~that splits~~ configured to split the mixed fundamental wave and triple-frequency wave into two signals having a phase difference of substantially 90 degrees.

Claim 4 (Currently Amended): A low-noise optical frequency converter, comprising:

a light wave input section;

a modulation signal input section;

a modulated light wave output section;

a Mach-Zehnder interferometer type single sideband (SSB) ~~SSB~~ modulator ~~for modulating~~ configured to modulate a light wave input to the light wave input section, provided with a first Mach-Zehnder interferometer type phase modulator and a second Mach-Zehnder interferometer type phase modulator on respective optical paths;

a first electrode configured to control ~~for controlling~~ a phase of a light wave provided on the first Mach-Zehnder interferometer type phase modulator;

a second electrode configured to control ~~for controlling~~ a phase of a light wave provided on the second Mach-Zehnder interferometer type phase modulator;

a third electrode configured to control ~~for controlling~~ a phase of a light wave propagating through each arm of the Mach-Zehnder interferometer type SSB modulator;

means for inputting a predetermined microwave electric signal;

means [[of]] for splitting the microwave electric signal into two signals having a phase difference of substantially 90 degrees; and

means [[of]] for applying the two signals to the modulation signal input section;

wherein a noise component included in an output of the Mach-Zehnder interferometer type SSB modulator generated by the phase difference between the two signals having the phase difference of substantially 90 degrees is suppressed by adjusting a bias voltage applied to the third electrode in accordance with the phase difference between the two signals.

Claim 5 (Currently Amended): A low-noise optical frequency converter, comprising:

a light wave input section;

a modulation signal input section;

a modulated light wave output section;

a Mach-Zehnder interferometer type single sideband (SSB) ~~SSB~~ modulator configured to modulate ~~for modulating~~ a light wave input to the light wave input section, provided with a first Mach-Zehnder interferometer type phase modulator and a second Mach-Zehnder interferometer type phase modulator on respective optical paths;

a first electrode configured to control ~~for controlling~~ a phase of a light wave provided on the first Mach-Zehnder interferometer type phase modulator;

a second electrode configured to control ~~for controlling~~ a phase of a light wave provided on the second Mach-Zehnder interferometer type phase modulator;

a third electrode configured to control ~~for controlling~~ a phase of a light wave propagating through each arm of the Mach-Zehnder interferometer type SSB modulator;

means for inputting a fundamental wave ~~constituting~~ of a predetermined microwave electric signal;

means for generating a wave having a frequency that is triple a frequency of the fundamental wave;

delay means ~~that can adjust~~ for adjusting a phase difference between the fundamental wave ~~constituting~~ being the microwave electric signal and the wave having a frequency that is triple a frequency of the fundamental wave;

means [[of]] for mixing the fundamental wave and the triple-frequency wave and splitting the mixed wave into two signals having a phase difference of substantially 90 degrees; and

means [[of]] for supplying electricity to the input section to which is input a signal used for modulating the signals;

wherein a noise component included in an output of the Mach-Zehnder interferometer type SSB modulator generated in accordance with the phase difference between the two signals having a phase difference of substantially 90 degrees is suppressed by adjusting a bias

voltage applied to the third electrode in accordance with the phase difference between the two signals.

Claim 6 (Currently Amended): The low-noise optical frequency converter according to claim 4, wherein the means ~~of~~ for splitting the microwave electric signal ~~mixed fundamental wave and triple-frequency wave~~ into two signals having a phase difference of substantially 90 degrees is a 90-degree hybrid.

Claim 7 (Currently Amended): The low-noise optical frequency converter according to claim 5, wherein the means [[of]] for splitting the mixed fundamental wave and triple-frequency wave into two signals having a phase difference of substantially 90 degrees is a 90-degree hybrid.

Claim 8 (Original): The low-noise optical frequency converter according to claim 4, wherein

the predetermined microwave electric signal is a microwave electric signal with a periodically changing frequency, with a frequency of output light changing in accordance with the frequency of the microwave electric signal.

Claim 9 (Original): The low-noise optical frequency converter according to claim 5, wherein

the predetermined microwave electric signal is a microwave electric signal with a periodically changing frequency, with a frequency of output light changing in accordance with the frequency of the microwave electric signal.

Claim 10 (Original): The low-noise optical frequency converter according to claim 6, wherein

the predetermined microwave electric signal is a microwave electric signal with a periodically changing frequency, with a frequency of output light changing in accordance with the frequency of the microwave electric signal.

Claim 11 (Original): The low-noise optical frequency converter according to claim 7, wherein

the predetermined microwave electric signal is a microwave electric signal with a periodically changing frequency, with a frequency of output light changing in accordance with the frequency of the microwave electric signal.

Claim 12 (Currently Amended): The low-noise optical frequency converter according to claim 8, ~~that includes a constitution~~ wherein

the predetermined microwave electric signal is a microwave electric signal having a frequency that changes on a time basis, a correspondence between the frequency and an optimum value for suppressing the noise component to which a bias voltage inside the Mach-Zehnder interferometer type SSB modulator is adjusted based on the frequency is obtained beforehand and the correspondence is used for adjusting to suppress the noise component.

Claim 13 (Currently Amended): The low-noise optical frequency converter according to claim 9, ~~that includes a con3astitution~~ wherein

the predetermined microwave electric signal is a microwave electric signal having a frequency that changes on a time basis, a correspondence between the frequency and an optimum value for suppressing the noise component, to which a bias voltage inside the

Mach-Zehnder interferometer type SSB modulator is adjusted based on the frequency, is obtained beforehand and the correspondence is used for adjusting to suppress the noise component.

Claim 14 (Currently Amended): The low-noise optical frequency converter according to claim 10, ~~that includes a constitution~~ wherein

the predetermined microwave electric signal is a microwave electric signal having a frequency that changes on a time basis, a correspondence between the frequency and an optimum value for suppressing the noise component, to which a bias voltage inside the Mach-Zehnder interferometer type SSB modulator is adjusted based on the frequency, is obtained beforehand and the correspondence is used for adjusting to suppress the noise component.

Claim 15 (Currently Amended): The low-noise optical frequency converter according to claim 11, ~~that includes a constitution~~ wherein

the predetermined microwave electric signal is a microwave electric signal having a frequency that changes on a time basis, a correspondence between the frequency and an optimum value for suppressing the noise component, to which a bias voltage inside the Mach-Zehnder interferometer type SSB modulator is adjusted based on the frequency, is obtained beforehand and the correspondence is used for adjusting to suppress the noise component.